Higher Technological Institute   (CT 253) Transportation Planning and Traffic Engineering   10ᵀᴴ OF RAMADAN CITY
Civil Engineering Department   Spring (2019)
Dr. Mohamed Reda   Assignment No. (4)
                                                Traffic Assignment

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1. The figure below shows the road network connecting the three zones A, B and C. The travel time of each link is also given. The total volume between zones A and B is 2400 pcu.'s.

The relation between the travel time on the link and the volume of traffic on that link is given as:

$T_2 = T_1 [1 + 0.15 (V/C)^4]$

where; T_2 is the new travel time, T_1 = old travel time, V = traffic volume veh./hr. and C = road capacity veh./hr.
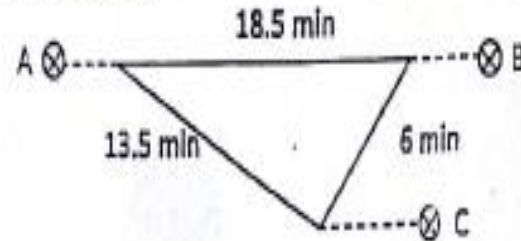

1) What are the volumes on each link using All or Nothing assignment without capacity restraint?
2) If all links are 2 lanes and the lane capacity is 1200 pcu.'s/hr. What is the volume on each link using All or Nothing assignment with capacity restraint (after only two iterations)

2. A hypothetical city is composed of three zones 1, 2, and 3. The travel time by private car is between brackets on each link. Some links of this network are used by public transport (bus) in both directions with average speed equals 20 km/hr.

Using the information given below, you are asked to answer the following:

a) Calibrate the Modal Split model to split between private car trips and bus trips.
b) Determine the future (year 2030) number of lanes of link "AB only" given that the lane capacity is 800 pcu/hr.
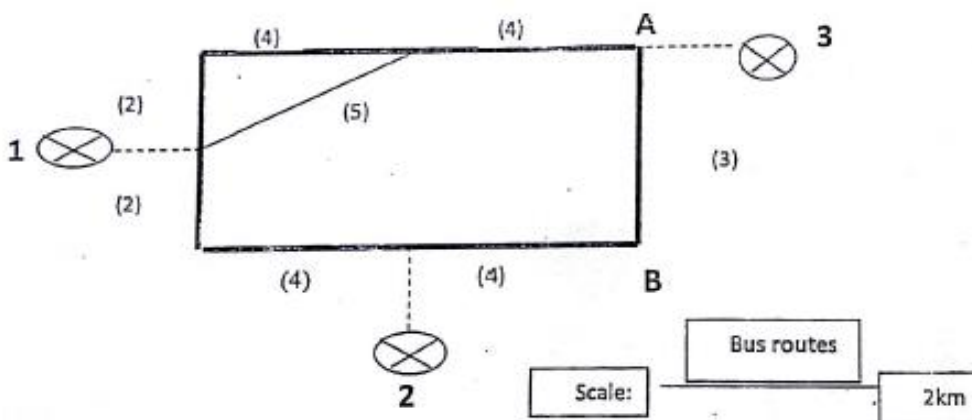
Present person trip O/D matrix (x10³).			
O \ D	1	2	3
1	--	100	50
2	80	--	60
3	100	50	--

Present person trip O/D matrix (x10³) using bus			
O \ D	1	2	3
1	--	35	10
2	28	--	36
3	20	30	--

O \ D	1	2	3
1	--	120	50
2	100	--	80
3	140	60	--

Year 2030 person trip O/D matrix (x10³)

> Necessary information:

- car occupancy rate = 1.5, and bus occupancy rate = 40.

- the passenger car unit of bus = 2.5.

  > When necessary, use All on Nothing traffic assignment for private car trips.

Future average speed for bus is 25 km/hr.